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ABSTRACT

At Cuyahoga Community College (Ohio), computer-controlled interactive videodisc technology is being used as one of several instructional methods to teach anatomy and physiology. The system has the following features: audio-visual instruction, interaction with immediate feedback, self-pacing, fill-in-the-blank quizzes for testing total recall, recognition practice using touch-screen quizzes, vocabulary-building exercises, and spelling exercises. The system operates with an IBM-XT, a 20 megabyte hard disc, a laser disc player, a touch screen monitor, and the QUEST program and other videodisc software created in-house. To use the system, the student chooses an area of study (e.g., skeletal system, muscular system, digestive system, or circulatory system), selects one of the learning modules for that area, and performs one of several lesson options (i.e., a 7- to 8-minute video tutorial module, a fill-in-the-blank quiz, a touch-screen quiz, vocabulary building exercises, or hear and spell exercises). At all times during the program, the student has the option of leaving any performance lesson and entering any other, choosing a different module, or quitting by simply pressing the escape key. (EJV)

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INTERACTIVE VIDEODISC AS A COMPONENT IN A
MULTI-METHOD APPROACH TO ANATOMY AND PHYSIOLOGY

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INTRODUCTION

Interactive videodisc has been incorporated into a multi-method approach to teaching anatomy and physiology at the community college level. It is in the process of being integrated with the following methods of instruction:

1. lecture booklet of performance objectives and diagrams
2. color-coded lecture outline overlays
3. laboratory manuals
4. slide/tape/script book review package
5. encased, keyed models
6. labeled photo print files
7. videotapes of lectures
8. computer programs:
 - a. self-tutorial question routine for lecture
 - b. direct selection of objective statements for lecture

STATEMENT OF THE PROBLEM

A problem recognized in the teaching of anatomy is that there is a great deal of information which must be acquired by the student in order to be knowledgeable about the subject, so that s/he can build concepts by manipulating the information. In an attempt to address this problem, several methods of delivery have been developed at CCC. One which is currently being developed is computer-controlled interactive videodisc. This system incorporates the following features:

1. audio-visual instruction
2. interaction with immediate feedback
3. self-pacing
4. total recall practice using fill-in-the-blank quizzes
5. recognition practice using touch-screen quizzes
6. vocabulary building exercises
7. spelling exercises

EQUIPMENT NEEDED

A functional system consists of the following pieces of equipment:

1. IBM-XT (or compatible)
2. 20 megabyte hard disc
3. Pioneer laser disc player LD-V4200
4. Zenith touch screen monitor from Allen Communication
5. software:
 - a. QUEST program
 - b. files created using QUEST authoring language
 - c. videodiscs produced in-house

AREAS OF STUDY

A menu will be presented to the student with the following areas of study:

1. Skeletal System
2. Muscular System
3. Digestive System
4. Circulatory System

Once the student has chosen an area of study, a menu of modules will be presented from which to choose. For example, if the skeletal system is chosen, a list of 18 modules is presented to the student. After the choice has been made, a performance menu of lesson options is presented for that module. A typical performance menu would contain the following lesson options:

1. Tutorial
2. Fill-in-the-blanks quiz
3. Touch-screen quiz
4. Vocabulary building exercise
5. Spelling exercise
6. Choose a different module
7. Quit

A brief explanation of each of these lesson options will indicate the purpose and potential of this technological method of instruction.

LESSON OPTIONS FOR STUDENTS

1. Tutorial Exercise

When this option is selected, the student will be presented with a video tutorial module averaging seven to eight minutes. During the tutorial, the program presents a unit of material visually and auditorily. During the presentation, character-generated captions appear on the video complementing what is being stated auditorily and demonstrated visually. For example, when the acromion process is being presented via the video, the term "ACROMION PROCESS" appears on the bottom of the screen. Not only does the student hear the term, s/he sees the correct spelling of the term. This aids in both pronunciation and spelling. When the tutorial is finished, s/he is returned to the performance menu.

2. Fill-in-the-Blank Quiz

The goals of the student will be to complete this option successfully. With a success rate of 100% on these quizzes, the student is prepared to make an equivalent grade on the in-class exams. This lesson is designed to test total recall and correct spelling, which are the goals which have been established for the student in the laboratory portion of this course. The question is presented to the student auditorily and visually from the disc. Each correct answer brings out the next question. If an incorrect answer is given, the student will be presented with the appropriate video from the tutorial which shows the anatomical location, gives the pronunciation, and the correct spelling of the term that was missed. Once the student has had adequate time to see the answer, s/he will be returned to the same question for another attempt. The student must answer the question correctly before the next question will be presented. If a student has difficulty attaining this level of knowledge, s/he may want to choose option #3, which is the touch-screen quiz that tests for recognition.

3. Touch-Screen Quiz

During this exercise the student will be presented with a still-frame slide and asked to identify a particular structure by touching it on the screen. Again, if a student makes a correct choice, s/he will continue on to the next question. If his/her choice is not correct, the appropriate video from the Tutorial will be presented giving the information necessary to answer the question. If the student continues to have trouble at this level of performance, s/he has the option of choosing the vocabulary building exercise.

4. Vocabulary Building Exercise

This option provides the student with either a tutorial or a quiz over the vocabulary terminology in the module. During the tutorial, a list of terms will be presented to the student one at a time. The term will be presented with its written definition and example. Following this presentation, the student can proceed at his/her own rate to the next frame which will show a still-frame slide demonstrating the anatomical usage of the term. During the quiz portion of this exercise, a multiple-choice test is used to determine the comprehension of these terms.

5. Hear and Spell Exercise

Spelling has been found to be a major stumbling block for many students of anatomy and physiology. This exercise has been designed for those students who would like to practice the spelling of the terms in the module. The student will hear the term pronounced twice, and is then instructed to type in the correct spelling. With a correct answer s/he will proceed to the next term. An incorrect answer will produce a screen with the term spelled in large letters. When the student is ready, the term will again be pronounced twice for him/her to try again.

At all times during the program, the student has the option of leaving any performance lesson and entering any other, or choosing a different module or quitting by simply pressing the escape key.